CONSTRUCTION SPECIFICATION

MI-182. PLASTIC (PVC, PE) PIPE

1. SCOPE

The work shall consist of furnishing and installing plastic pipe and the necessary fittings specified herein or as shown on the drawings. This specification does not cover subsurface drainage systems.

2. MATERIALS

a. Pipe

I. Corrugated Polyethylene (PE) Tubing. Corrugated PE tubing and fittings shall conform to the requirements of the applicable specification listed below:

Kind of Pipe	ASTM Specification
Corrugated PE Tubing and Fittings, Size 3 to 6 inches (75 to 150 mm), inclusive	F 405
Large Diameter Corrugated PE Tubing and Fittings, Size 8 to 24 inch (200 to 600 mm), inclusive	F 667
PE Large Diameter Profile Wall Sewer and Drain Pipe	F 894

II. Poly (Vinyl Chloride) (PVC) Plastic Pipe. PVC pipe and fittings shall conform to the requirements of the applicable specification listed below:

Kind of Pipe	ASTM Specification
PVC Plastic Pipe, Schedules 40, 80 and 120	D 1785
PVC Pressure-Rated Pipe (SDR Series)	D 2241

b. Fittings and Joints

Where pressure pipe is specified, fittings shall have a design capacity equal to or exceeding that specified for the pipe to which it is attached. Fittings shall be cast iron, steel, one piece injection molded plastic fitting or fabricated from plastic pipe and one piece injection molded plastic fittings. Pressure pipe fittings shall conform to the requirements of the applicable specification listed in TABLE 182-1.

Where nonpresssure pipe is specified, the fittings shall be of the same or similar materials as the pipe and shall provide the same durability and strength as the pipe.

Joints may be bell and spigot type with elastomeric gaskets, coupling type with elastomeric gasket on each end, or solvent cemented. When a lubricant is required to facilitate joint assembly, it shall be a type having no detrimental effect on the gasket or pipe material.

Solvent cemented joints for PVC pipe and fittings shall be in accordance with ASTM D 2855.

Mechanical joints (split couplings and snap couplings) may be used when joining PE pipe and fittings with nonpressure flow and a free draining sand or gravel bedding

material. Elastomeric-sealed mechanical joints shall be used when joining PE pipe and fittings under pressure flow or where seepage cannot be tolerated.

Pipe joints shall conform to the details shown on the drawings and specified herein.

Pipe shall be installed and joined in accordance with the manufacturer's recommendations, except as otherwise specified.

3. HANDLING AND STORAGE

Pipe shall be delivered to the job site and handled by means which provide adequate support to the pipe and does not subject it to undue stresses or damage. When handling and placing plastic pipe, care shall be taken to prevent impact blows, abrasion damage, and gouging or cutting (by metal surfaces or rocks). All special handling requirements of the manufacturer shall be strictly observed. Special care shall be taken to avoid impact when the pipe must be handled at temperatures of 40°F (4.4°C) or less.

Pipe shall be stored on a relatively flat surface so that the barrels are evenly supported. Unless the pipe is specifically coated to withstand exposure to ultraviolet radiation, it shall be covered with an opaque material when stored outdoors for a period of 15 days or longer.

4. LAYING AND BEDDING THE PIPE

Plastic pipe conduits and fittings shall be installed as shown on the drawings and specified herein. The pipe shall be laid so that there is no reversal of grade between joints, unless otherwise shown on the drawings. The pipe shall be placed with the bell end upstream, unless otherwise specified. The pipe shall be carefully placed on the bedding or into the pipe trench.

Care shall be taken to prevent distortion and damage during unusually hot (over 90°F/32°C) or cold weather (under 40°F/4.4°C). After the pipe has been assembled in the trench, it shall be allowed to reach ground temperature before backfilling to prevent pull out of joints due to thermal contraction.

The pipe ends and the couplings shall be free of foreign material when assembled. During the placement of the pipe, each open end of the pipeline shall be closed off by a suitable cover or plug at the end of work on the pipeline each day and until work resumes or installation is complete.

Perforated pipe shall be laid with the perforations down and oriented symmetrically about the vertical centerline. Perforations shall be clear of any obstructions when the pipe is laid.

Pipe shall be firmly and uniformly supported throughout the entire length. Bell-holes shall be made in the bedding under bells or couplings and other fittings to prevent the pipe from being supported by fittings.

a. Earth Bedding. When bedding is specified the pipe shall be firmly and uniformly bedded in a shaped bedding groove that closely conforms to the bottom of the pipe for a depth equal to a minimum of 1 inch (25 mm) or 5 percent of the diameter of the pipe, whichever is greater. The bedding material shall be free of rocks or stones greater than 0.5 inch (13 mm) diameter and earth clods greater than 2 inch (50 mm) diameter.

b. Sand or Gravel Bedding, or Drain Fill. When sand or gravel bedding is specified, the pipe shall be firmly and uniformly placed on a sand or gravel bed. Sand or gravel fill shall be carefully placed and compacted as specified herein and as shown on the drawings.

5. BACKFILL

The pipe shall be held down during backfilling to the top of the pipe to prevent its being lifted from its original placement.

Within 2 feet (0.6 m) of the pipe, backfill shall be carefully placed and compacted by means of hand tamping or manually directed power tampers or plate vibrators to form a continuous uniform support around the pipe. Maximum thickness of layers before compaction within 2 feet (0.6 m) of the pipe shall be 4 inches (100 mm) and at more than 2 feet (0.6 m) from the pipe a maximum thickness before compaction shall be 9 inches (230 mm). Unless otherwise specified, the initial backfill shall be compacted to a density equivalent to that of the adjacent fill or foundation materials.

The water content of cohesive backfill material shall be such that, kneaded in the hand, the soil will form a ball which does not readily separate. For non-cohesive sand and gravel backfill material, water content is not a concern for thin lifts.

TABLE 182-1 - FITTINGS SPECIFICATIONS

Kind of Fitting	ASTM Specification
Threaded PVC Plastic Pipe Fittings, Schedule 80	D 2464
PVC Plastic Pipe Fittings, Schedule 40	D 2466
Socket-Type PVC Plastic Pipe Fittings, Schedule 80	D 2467
Butt Heat Fusion PE Plastic Fittings for PE Plastic Pipe and Tubing	D 3261
Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals	D 3139
PVC Pressure Pipe, 4-in. - 12-in. (100 mm – 300 mm), for Water	C 900
PVC Water Transmission Pipe, Nominal Diam., 14-in. - 36-in. (350 mm – 900 mm)	C 905